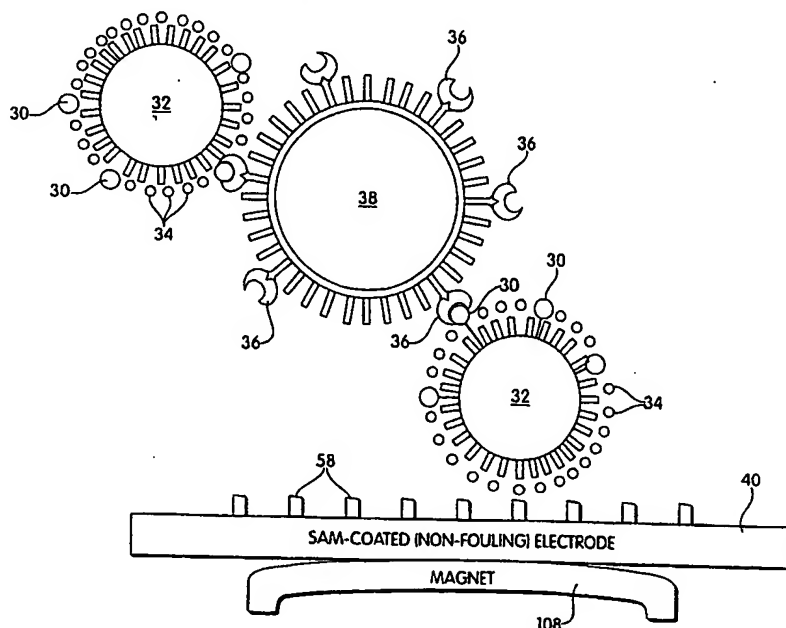


PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : G01N 33/543		A3	(11) International Publication Number: WO 00/43783
			(43) International Publication Date: 27 July 2000 (27.07.00)
(21) International Application Number: PCT/US00/01504			(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
(22) International Filing Date: 21 January 2000 (21.01.00)			
(30) Priority Data:			
60/116,975 23 January 1999 (23.01.99) US			
60/132,289 3 May 1999 (03.05.99) US			
60/133,148 7 May 1999 (07.05.99) US			
60/133,772 12 May 1999 (12.05.99) US			
(71) Applicant (for all designated States except US): MINERVA BIOTECHNOLOGIES CORPORATION [US/US]; 142 Church Street, Newton, MA 02458 (US).			Published With international search report.
(72) Inventors; and			
(75) Inventors/Applicants (for US only): BAMDAD, Cynthia, Carol [US/US]; 142 Church Street, Newton, MA 02458 (US). BAMDAD, R., Shoshana [US/US]; 142 Church Street, Newton, MA 02458 (US).			
(74) Agent: OYER, Timothy, J.; Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210 (US).			
(88) Date of publication of the international search report: 2 November 2000 (02.11.00)			

(54) Title: INTERACTION OF COLLOID-IMMOBILIZED SPECIES WITH SPECIES ON NON-COLLOIDAL STRUCTURES



(57) Abstract

The invention provides novel techniques for derivatizing colloids with self-assembled monolayers. This provides the capability of a wide variety of assays including chemical or biochemical agent/agent interaction studies. Bio-derivatized colloids, with or without signaling entities, are used to probe interactions with species on non-colloidal structures. The invention provides techniques for immobilizing colloidal particles on a wide variety of non-colloidal structures. Included is the ability to decorate a variety of non-colloidal structures including beads, with colloids as a detectable assay. This allows, in many cases, assays detectable via the unaided human eye, as well as assays detectable via automated determination of a change of interaction of electromagnetic radiation with the colloids, e.g., absorption, light-scattering, and the

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/01504

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01N33/543

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, BIOSIS, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 945 045 A (FORREST GORDON C ET AL) 31 July 1990 (1990-07-31) column 12, line 50 -column 13, line 20 column 10, line 65 - line 58	1-163
A	<p>---</p> <p>G A ROBINSON, H A O HILL, R D PHILO, J M GEAR, S J RATTLE, G C FORREST: "Bioelectrochemical Enzyme Immunoassay of Human Choriogonadotropin with Magnetic Electrodes" CLINICAL CHEMISTRY, vol. 31, no. 9, 1985, pages 1449-1452, XP002142426 the whole document</p> <p>---</p> <p style="text-align: center;">-/--</p>	1-163



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

13 July 2000

Date of mailing of the international search report

28/07/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Hart-Davis, J

INTERNATIONAL SEARCH REPORT

Inter. Appl. No.
PCT/US 00/01504

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 579 343 A (EPPENDORF NETHELER HINZ GMBH G) 19 January 1994 (1994-01-19) column 3, line 38 -column 4, line 1 column 4, line 23 - line 31; figures 1,2 ---	1-163
A	US 5 620 850 A (BAMDAD CYNTHIA C ET AL) 15 April 1997 (1997-04-15) cited in the application claims 1-28; example 1 ---	1-163
A	DE 38 06 558 A (HITACHI LTD) 15 September 1988 (1988-09-15) claims 1,3,6,12,13 ---	1,36,63, 66
P,A	CHOI MYUNG JA; KIM SO YOUNG; CHOI JEONGEUN; PAENG INSOOK RHEE: "Labeling digoxin antibody with colloidal gold and ferrocene for its use in a membrane immunostrip and immunosensor" MICROCHEMICAL JOURNAL, vol. 63, September 1999 (1999-09), pages 92-99, XP000924842 the whole document -----	1-163

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

In view of the large number and also the wording of the claims presently on file, which render it difficult, if not impossible, to determine the matter for which protection is sought, the present application fails to comply with the clarity and conciseness requirements of Article 6 PCT (see also Rule 6.1(a) PCT) to such an extent that a meaningful search is impossible. Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found only a very small proportion of the methods and articles which could fall under the claims as filed. It was not possible to derive from the application which specific technical problem is to be solved (page 2, lines 13-22 discuss a number of distinct problems), nor which is the specific solution to the technical problem which constitutes the invention (see in particular pages 3-8). The present application thus also fails to comply with the requirements of Rule 5.1 (a) (iii) PCT. Consequently, the search has been carried out for those parts of the application which do appear to be clear (and concise), namely the electrochemical binding assays of Examples 1,3 and 7 (and the materials used therein) in which a colloidal particle bearing a first protein and also bearing a signal entity (an electroactive ferrocene moiety) is combined with a non-colloidal structure (magnetic beads in Ex.1 and Ex.7, cells growing on electrode surfaces in Ex.3), where the non-colloidal structure bears a second protein binding to the first protein, optionally in the presence of a candidate agent for drug screening.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/01504

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4945045	A	31-07-1990	AT 100203 T	15-01-1994
			AU 597562 B	07-06-1990
			AU 4241185 A	09-01-1986
			CA 1268520 A	01-05-1990
			DE 3587720 D	24-02-1994
			DE 3587720 T	01-06-1994
			EP 0167248 A	08-01-1986
			IL 75174 A	12-07-1990
EP 0579343	A	19-01-1994	DE 4223791 C	18-11-1993
US 5620850	A	15-04-1997	NONE	
DE 3806558	A	15-09-1988	JP 63214668 A	07-09-1988